

# Bartholomew Engineering, Inc.

SFUND RECORDS CTR

88005426

[0217-00781]

Environmental

Civil

Water/Wastewater

Subdivisions

Surveying

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Richard F. Bartholomew, P.E., R.L.S.  
President

SFUND RECORDS CTR  
0217-00781

August 13, 1993

Mr. Craig Cooper  
U.S. EPA Region IX  
75 Hawthorne Street, H-7-2  
San Francisco, CA 94105

RE: PGA OPERABLE UNIT 16; PHOENIX-GOODYEAR AIRPORT SUPERFUND SITE  
SECOND QUARTER REPORT -- NO. 1993-2  
APRIL, MAY, JUNE 1993  
Job No. 731189

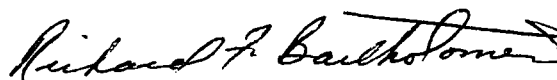
Dear Craig,

In accordance with the approved reporting schedule we are transmitting the referenced report items.

- PGA OPERABLE UNIT 16 OPERATIONS SECOND 1993 QUARTERLY REPORT
- MONITORING WELL WATER LEVEL AND CHEMICAL ANALYSIS REPORT, PRINTED DATA REPORT (EPA), COMPUTER DISK-FOXPOR-DATABASE (URS ONLY)
- TREATMENT PLANT AND INFLUENT AND EFFLUENT CHEMICAL ANALYSIS REPORT, PRINTED DATA REPORT (EPA), COMPUTER DISK-FOXPOR-DATABASE (URS ONLY)
- PRINTS AND ACETATE OVERLAYS MAPS FOR TCE CONCENTRATIONS (ISOPLETHS MAP) AND SUBUNIT A GROUNDWATER ELEVATIONS (CONTOUR) MAPS, JUNE 1993 DATABASE.

Please contact us if you have any questions or need further information.

Sincerely,



Richard F. Bartholomew, P.E.

cc: Edward P. Waltz, The Goodyear Tire & Rubber Co. (letter, report and prints)

Larry Smith, URS Consultants (letter, prints, and computer disk of FoxPro database)

Todd Struttman, Sharp & Associates (letter, report, disk, overlays, prints, and printed data)

Cynthia Parker, City of Phoenix (letter, report, and printed data)

Donn Stoltzfus, City of Phoenix (letter, report, overlays, prints, and printed data).

Enclosures

**PGA-OPERABLE UNIT 16 SECOND QUARTER REPORT NO. 1993-2**  
**REPORT PERIOD - APRIL, MAY, JUNE, 1993**  
(April 1, 1993 - June 31, 1993)

**SUMMARY**

■	TOTAL WATER TREATED DURING QUARTER - 72,864,802 (gallons)		
■	TOTAL WATER TREATED TO DATE - 609,203,494 (gallons)		
■	TCE LEVELS - ug/l (ppb)	<u>INFLUENT</u>	<u>EFFLUENT</u>
	April (4/14/93)	150	2.8
	May (5/26-5/28)	220	2.9
	June (6/7/93)	230*	3.55*

\*Average value (6/23/93)

- DAYS OF OPERATIONS -- 70 days out of 91 days in period.
- ZONE OF CAPTURE -- Approximately 2' depth around Extraction Wells NE-1 through NE-5
- ESTIMATED POUNDS OF TCE REMOVED THIS PERIOD - 119.54
- ESTIMATED POUNDS OF TCE REMOVED TO DATE - ESTIMATED 955.30
- ESTIMATED GALLONS OF TCE REMOVED TO DATE - 77.67

**DETAILED REPORT**

<u>MONTH</u>	<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>
Total Water Extracted, gallons	25,481,770	15,133,968	32,249,064
Total Water Reinjecting, gallons	24,653,640	14,755,665	31,456,310
average Flow, gpm	632	751	803
Days of Plant Operation	28	14	28

**Treated Plant TCE levels (ug/l)**

A.	Influent	150	220	230
B.	Effluent	2.8	2.9	3.55
C.	Percent Reduction	98.13	98.68	98.46
D.	Estimated Total TCE Removed (pounds)	31.23	27.40	60.91
E.	Estimated Average TCE Removed (pounds per day)	1.12	1.96	2.18

## OPERATIONAL COMMENTS

### EXTRACTION WELLS

- Wells No. NE-1, 2, 3, 4, 5 and E-7, 8, 10, 11, and E-12 operated during the quarterly period as shown below.
- EXTRACTION WELL OPERATIONAL DATA THIS QUARTER:

<u>Well No.</u>	<u>Average GPM</u>	<u>Operational Days this Quarter</u>
NE-1	122	70
NE-2	70	70
NE-3	104	70
NE-4	90	70
NE-5	104	70
E-7	3	70
E-8	28	70
E-10	55	70
E-11	95	70
E-12	<u>102</u>	70
TOTAL	728 GPM	

- AVERAGE GPM FOR QUARTERLY PERIOD = 728
- Motors on Wells NE-3 and NE-8 found to be defective and were replaced.

### PLANT OPERATIONS

- The carbon air treatment was in operation each operational day during the quarter.
- The plant acid piping system was completely replaced with teflon piping and valves to prevent future acid line leaks. The plant was out of service for 14 days to replace the acid piping system and clean out the acid containment vault.
- Tests have been completed to evaluate the air stripping tower efficiency. The air flow was measured throughout the treatment plant. Samples of the water influent and effluent were taken for TCE levels. Results of the samples are shown on the attached summary. During the Tower evaluation and modification period the tower was out of service 7 days. Two days for packing additional placement and five days spread over May and June for testing.

Based upon the study, RE Wright and Environmental Restoration System recommended that an additional 18" of packing be added to the top of the

town and the inlet piping be modified to better distribute the influent (extraction) water across the top of the tower. The additional packing was added to the tower and the inlet piping will be added during July. Sample results show a slight improvement. However, the designers are continuing to evaluate the tower packing and water distribution to improve the treatment efficiency.

#### INJECTION WELLS

- Eight, Phase II injection Wells were in operation during this period. The injection system averaged 654 GPM. Approximately 74 GPM (10.2%) was lost through evaporation and meter losses.
- Eight injection wells are being held in reserve.

#### ZONE OF CAPTURE

- The water level map prepared for this quarter shows that the zone of capture has been re-established along the extraction wells NE-1 through NE-5. The zone of capture near well E-12 is limited to the immediate well area as indicated by the change in the water level contour lines near well E-12.

#### TCE LEVEL REDUCTION

- During this period 119.54 pounds of TCE was estimated to have been removed from the Sub Unit A groundwater.
- To date, it is estimated that 955.30 pounds of TCE have been removed from the Sub Unit A groundwater. This is approximately 77.67 gallons.
- The current average removal rate is 1.75 pounds per day.

#### DAYS IN OPERATION

- Days in operation during reporting period was 86.94 days out of 91 days during the quarterly period.

Reason for Plant Out of Service	Days	Corrective Action Taken
Break in acid piping at storage tank	14	Replace entire acid piping system between tank and pumps with teflon tubing and teflon and viton lined valves.
Testing and evaluation air stripping tower to improve treatment efficiency and to add more packing material	7	Added additional packing material (Jaeger Packing)

#### MONITORING WELLS

- Completed monthly, quarterly, and semi-annual water level and sampling of Sub-Unit A and B/C monitoring wells in accordance with the EPA approved monitoring plan.
- Completed monthly water level measurements of Sub-Unit A monitoring wells in 2 day period to determine zone of capture.
- Assisted attorney in preparation of access agreements for Monitoring wells EMW-25A and EMW-26A.

PGA-EPA Report  
PGA Operable Unit--16  
Quarterly Report 1993-2  
August 13, 1993  
Bartholomew Engineering, Inc.

## TOWER REPORT

## AIR STRIPPING TOWER DATA REVIEW

13-Aug-93

Page 1 of 3

DATE	TCE INFL (ppb)	TCE EFFL (ppb)	WATER FLOW (gpm)	AIR FLOW (cfm)	AIR TO WATER RATIO	TOWER % EFFIC	COMMENTS
02/07/90	230	1.9	354	2826	59.71	99.17	
02/15/90	340	1.0	452	3140	51.96	99.71	
02/20/90	300	1.0	318	2826	66.47	99.67	
05/25/90	245	3.1	471	3925	62.33	98.73	
06/20/90	380	2.5	290	4239	109.34	99.34	
07/18/90	340	2.6	398	4082	76.72	99.24	
08/17/90	340	2.8	480	3517	54.81	99.18	
09/23/90	370	0.8	371	3925	79.13	99.78	
10/18/90	220	1.0	404	3768	69.76	99.55	
11/25/90	490	1.8	400	3768	70.46	99.63	
12/18/90	300	1.5	485	3925	60.53	99.50	
01/23/91	191	1.8	450	4019	66.80	99.06	
02/17/91	150	1.7	490	3717	56.74	98.87	
03/17/91	210	1.2	349	4019	86.14	99.43	
04/22/91	210	1.1	393	4082	77.69	99.48	
05/22/91	210	1.8	428	3768	65.85	99.14	
06/20/91	240	1.7	262	4082	116.54	99.29	
07/12/91	240	1.7	406	3611	66.53	99.29	
07/21/91	250	1.2	411	3799	69.14	99.52	
08/19/91	227	1.9	427	3768	66.01	99.16	
09/22/91	170	1.0	409	3768	68.91	99.41	
01/19/92	200	0.9	320	3454	80.74	99.55	
03/19/92	180	2.5	361	3768	78.07	98.61	
05/15/92	160	4.6	567	4082	53.85	97.13	(1)
05/27/92	287	2.4	518	4082	58.94	99.16	(2)
06/19/92	160	2.4	376	3768	74.96	98.50	(3)
07/13/92	250	1.8	391	3611	69.08	99.28	
07/22/92	250	2.4	452	3768	62.36	99.04	
08/20/92	150	2.3	490	3768	57.52	98.47	
09/22/92	160	2.6	500	4082	61.07	98.38	
10/02/92	200	1.2	450	3768	62.63	99.40	
11/10/92	180	4.4	488	3454	52.94	97.56	(4)
11/17/92	160	3.9	568	3768	49.62	97.56	
11/24/92	260	4.6	578	3611	46.73	98.23	(5)
12/01/92	220	4.0	578	3768	48.76	98.18	(6)
12/09/92	200	3.1	591	5338	67.56	98.45	
01/30/93	220	3.6	564	5338	70.79	98.36	
02/22/93	210	2.6	561	5495	73.27	98.76	
03/15/93	220	4.0	679	5966	65.72	98.18	
03/25/93	180	8.2	557	5966	80.12	95.44	(13)
04/14/93	150	2.8	636	5024	59.09	98.13	
05/14/93	200	4.6	708	5809	61.37	97.70	(7)
05/14/93	210	13.0	740	5909	59.73	93.81	(7)(8)(13)
05/19/93	NS	5.8	800	6280	58.72	97.24	(7)(13)
05/19/93	NS	6.0	800	6280	58.72	97.14	(7)(8)(13)
05/19/93	NS	6.6	800	6280	58.72	96.86	(7)(8)(13)
05/20/93	190	4.9	820	6526	59.53	97.42	(7)(13)
05/21/93	140	2.1	586	6526	83.30	98.50	(7)(9)



## AIR STRIPPING TOWER DATA REVIEW

13-Aug-93

Page 2 of 3

DATE	TCE INFL (ppb)	TCE EFFL (ppb)	WATER FLOW (gpm)	AIR FLOW (cfm)	AIR TO WATER RATIO	TOWER % EFFIC	COMMENTS
05/21/93	220	7.2	820	4500	41.05	96.73	(7)(13)
05/22/93	220	6.0	820	4500	41.05	97.27	(7)(13)
05/24/93	NS	4.4	820	6280	57.29	98.00	(7)
05/24/93	NS	6.0	820	4500	41.05	97.27	(7)(13)
05/24/93	NS	4.3	820	6280	57.29	98.05	(7)
05/26/93	220	4.4	820	6280	57.29	98.00	(7)
05/28/93	NS	3.2	820	6280	57.29	98.55	(7)
05/28/93	NS	4.3	820	6908	63.01	98.05	(7)(M)
05/31/93	NS	2.5	820	6280	57.29	98.86	(7)
05/31/93	NS	3.8	820	6594	60.15	98.27	(7)(M)
06/01/93	NS	3.7	820	6437	58.72	98.32	(7)(M)
06/01/93	NS	3.9	820	6123	55.85	98.23	(7)(M)
06/01/93	NS	4.1	820	5589	50.98	98.14	(7)(M)
06/01/93	NS	5.1	820	5118	46.69	97.68	(7)(M)(13)
06/01/93	NS	10.0	820	4647	42.39	95.45	(7)(M)(13)
06/01/93	NS	14.0	820	4144	37.80	93.64	(7)(M)(13)
06/01/93	NS	4.5	820	6594	60.15	97.95	(7)(M)
06/01/93	NS	4.5	820	6280	57.29	97.95	(7)(M)
06/01/93	NS	4.9	820	5620	51.27	97.77	(7)(M)(13)
06/01/93	NS	5.2	820	5149	46.97	97.64	(7)(M)(13)
06/01/93	NS	6.9	820	4647	42.39	96.86	(7)(M)(13)
06/01/93	NS	7.8	820	4144	37.80	96.45	(7)(M)(13)
06/01/93	NS	2.5	820	6437	58.72	98.86	(7)
06/01/93	NS	3.8	820	6437	58.72	98.27	(7)
06/01/93	NS	4.3	820	6437	58.72	98.05	(7)
06/02/93	170	3.1	820	6437	58.72	98.18	(7)
06/04/93	180	3.4	800	3297	30.83	98.11	
06/07/93	210	3.0	800	6280	58.72	98.57	
06/09/93	200	3.3	800	6908	64.59	98.35	(7)
06/09/93	240	3.6	800	6908	64.59	98.50	(7)
06/09/93	210	3.8	800	6908	64.59	98.19	(7)
06/09/93	230	3.6	820	6908	63.01	98.43	(7)
06/10/93	250	8.6	840	6908	61.51	96.56	(13)
06/10/93	250	6.7	840	6908	61.51	97.32	(7)(13)
06/11/93	200	4.7	840	6908	61.51	97.65	(7)
06/11/93	140	4.8	840	6908	61.51	96.57	(7)
06/11/93	120	5.6	840	6908	61.51	95.33	(7)(13)
06/11/93	130	5.7	840	6908	61.51	95.62	(7)(13)
06/11/93	190	4.9	840	6908	61.51	97.42	(7)(13)
06/11/93	210	5.6	840	6908	61.51	97.33	(7)(13)
06/13/93	180	1.3	450	6280	104.39	99.28	
06/14/93	180	1.3	450	6280	104.39	99.28	(10)
06/15/93	200	0.7	480	6280	97.86	99.65	(10)
06/15/93	NS	0.8	480	6280	97.86	99.60	
06/16/93	210	0.9	490	6280	95.87	99.57	(10)
06/17/93	210	1.5	550	6280	85.41	99.29	(11)
06/18/93	210	2.0	590	6280	79.62	99.05	(12)
06/23/93	240	4.1	820	6280	57.29	98.29	

DATE	TCE INFL (ppb)	TCE EFFL (ppb)	WATER FLOW (gpm)	AIR FLOW (cfm)	AIR TO WATER RATIO	TOWER % EFFIC	COMMENTS
06/23/93	190	4.1	820	6280	57.29	97.84	
06/24/93	200	4.1	732	6280	64.17	97.95	
06/25/93	130	3.4	732	6908	70.59	97.38	
06/25/93	170	3.4	732	6908	70.59	98.00	
07/09/93	NS	2.0	820	6280	57.29	98.82	
07/09/93	NS	3.4	820	6280	57.29	98.00	
07/12/93	220	2.6	840	6280	55.92	98.47	
07/19/93	220	4.1	860	5000	43.49	98.14	

## NOTES

1. Started E-12 trial run.
2. Treatment okay with higher TCE.
3. Installed new 15 HP blower on tower.
4. VIC unit and well E-12 on trial run.
5. Well E-12 on.
6. VIC unit & well E-12 on after air was increased.
7. Experimental samples to test tower efficiency. All wells on.
8. VIC unit off.
9. Wells NE-5 and E-12 off.
10. Wells NE-1, NE-2, NE-3, NE-4, and NE-5 on.
11. Wells NE-1, NE-2, NE-3, NE-4, NE-5, and E-10 on.
12. Wells NE-1, NE-2, NE-3, NE-4, NE-5, E-8, and E-10 on.
13. Sample was taken during tower tests under controlled conditions where the effluent water flow and air flow were being changed to evaluate the tower efficiency under varying conditions. Test runs were of short duration under 1-2 hours to allow for stabilization of flow conditions only. Tower operation was returned to normal flow rate once the tests and sample collection was completed.

VIC unit is on unless noted otherwise.

NS = No Sample; Used previous day influent level in calculations.

M = Mobile laboratory test.

SUB UNIT A GROUNDWATER LEVEL CHANGES  
DURING SECOND QUARTERLY PERIOD

07/16/93

PHOENIX-GOODYEAR AIRPORT SITE  
WATER LEVELS SUBUNIT A WELLS  
COMPARISON OF MAY AND JUNE LEVELS

WELL NAME	MEAS.PT ELEVATION	DEPTH TO WATER 05/18/93	WATER TABLE ELEVATION 05/18/93	DEPTH TO WATER 06/10/93	WATER TABLE ELEVATION 06/10/93	DELTA 6/10-5/18
15GMW-4	965.00	46.2	918.8	46.1	918.9	0.1
15GMW-5	959.45	40.6	918.9	40.4	919.1	0.2
16EMW-10	957.85	46.1	911.8	45.8	912.1	0.3
16EMW-11	958.49	47.8	910.7	47.3	911.2	0.5
16EMW-12	957.80	47.0	910.8	48.3	909.5	-1.3
16EMW-14	956.61	48.4	908.2	48.4	908.2	0.0
16EMW-15	958.14	51.7	906.4	51.5	906.6	0.2
16EMW-16	962.40	54.4	908.0	53.8	908.6	0.6
16EMW-17	970.10	60.6	909.5	59.7	910.4	0.9
16EMW-3	962.97	50.0	913.0	49.9	913.1	0.1
16EMW-4	960.36	47.2	913.2	47.1	913.3	0.1
16EMW-5	966.39	54.6	911.8	54.6	911.8	0.0
16EMW-6	960.06	47.3	912.8	47.4	912.7	-0.1
16EMW-7	960.04	49.1	910.9	49.2	910.8	-0.1
16EMW-8	961.92	49.4	912.5	49.1	912.8	0.3
16EP-1	963.05	50.3	912.8	50.7	912.3	-0.4
16EP-2	955.42	47.1	908.3	47.0	908.4	0.1
16EP-4	952.33	41.2	911.1	41.3	911.0	-0.1
16GMW-3	962.20	46.7	915.5	46.4	915.8	0.3
16GMW-6	962.97	48.1	914.9	48.0	915.0	0.1
16GMW-7	962.84	45.9	916.9	45.6	917.2	0.3
16GMW-8	964.26	50.8	913.5	50.5	913.8	0.3
16GP-1	960.07	44.7	915.4	44.6	915.5	0.1
16GP-2	962.95	49.3	913.7	49.2	913.8	0.1
16GP-7	964.03	49.4	914.6	49.9	914.1	-0.5
21EMW-13	950.71	44.2	906.5	44.7	906.0	-0.5
21EP-3	940.75	38.1	902.7	38.6	902.2	-0.5
EMW-23A	934.83	33.5	901.3	32.5	902.3	1.0
EMW-24A	942.82	40.4	902.4	40.2	902.6	0.2
EMW-25A	935.25	39.2	896.1	39.7	895.6	-0.5
EMW-26A	950.88	46.0	904.9	46.7	904.2	-0.7
EMW-29A	971.80	59.5	912.3	59.1	912.7	0.4
EO-1	944.35	42.8	901.6	43.1	901.3	-0.3
EO-2	945.34	42.9	902.4	43.5	901.8	-0.6
EO-3	944.89	43.2	901.7	44.3	900.6	-1.1
EO-4	946.73	42.5	904.2	42.9	903.8	-0.4
EO-5	950.09	44.2	905.9	44.5	905.6	-0.3
EO-6	no well		0.0		0.0	0.0
EO-7	957.87	47.8	910.1	47.7	910.2	0.1
EO-8	959.12	46.8	912.3	46.7	912.4	0.1
EO-9	no well		0.0		0.0	0.0
EO-10	961.22	48.7	912.5	48.9	912.3	-0.2
EO-12	956.75	47.2	909.6	45.5	911.3	1.7
E-3	941.54	38.1	903.4	39.0	902.5	-0.9
E-4	940.07	33.0	907.1	36.5	903.6	-3.5
E-10	957.56	46.0	911.6	45.2	912.4	0.8
IO-1	934.35	32.2	902.2	31.5	902.9	0.7
IO-2	930.51	27.7	902.8	26.4	904.1	1.3

07/16/93

PHOENIX-GOODYEAR AIRPORT SITE  
WATER LEVELS SUBUNIT A WELLS  
COMPARISON OF MAY AND JUNE LEVELS

WELL NAME	MEAS.PT ELEVATION	DEPTH TO WATER 05/18/93	WATER TABLE ELEVATION 05/18/93	DEPTH TO WATER 06/10/93	WATER TABLE ELEVATION 06/10/93	DELTA 6/10-5/18
IO-4	938.12	38.6	899.5	38.1	900.0	0.5
IO-5	934.82	33.4	901.4	32.5	902.3	0.9
IO-6	940.59	43.2	897.4	42.6	898.0	0.6
IO-7	936.45	38.4	898.1	37.9	898.6	0.5
IO-8	943.88	45.4	898.5	45.7	898.2	-0.3
IO-9	940.94	39.3	901.6	38.8	902.1	0.5
IO-10	940.96	39.4	901.6	39.6	901.4	-0.2
IO-12	939.75	35.5	904.3	35.5	904.3	0.0
IO-13	948.93	44.9	904.0	45.0	903.9	-0.1
IO-14	932.12	29.2	902.9	28.3	903.8	0.9
IO-16	932.97	30.3	902.7	29.2	903.8	1.1
IO-17	943.79	41.3	902.5	40.9	902.9	0.4
IO-18	954.54	50.8	903.7	50.9	903.6	-0.1
NEW-1	937.81	35.7	902.1	36.6	901.2	-0.9
NEW-2	943.21	41.0	902.2	41.9	901.3	-0.9
NEW-3	953.13	46.3	906.8	46.5	906.6	-0.2
NEW-4	957.19	53.2	904.0	53.2	904.0	0.0
NEW-8	950.77	49.0	901.8	48.3	902.5	0.7
NEW-9	955.97	47.6	908.4	49.7	906.3	-2.1